APPENDIX C3

SITE-SPECIFIC FIELD SAMPLING PLAN

WILLOW STREET/HAWTHORNE AVENUE STATION OPERABLE UNIT

Prepared for:

Peoples Gas Light and Coke Company

Managed by:

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Chicago, Illinois 60601

Prepared For Use By:

Natural Resource Technology, Inc.

Revision 1
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1 INTRODUCTION

1.1 Background

This Site-Specific Field Sampling Plan (FSP) was prepared in accordance with the Statement of Work (SOW) attached to the Settlement Agreement and Administrative Order on Consent (AOC) between the United States Environmental Protection Agency (USEPA) and The Peoples Gas Light and Coke Company (Peoples Gas), CERCLA Docket No. V-W-'08-C-917, effective October 31, 2008. The AOC/SOW addresses four former Manufactured Gas Plant (MGP) Sites operated by Peoples Gas and specifies that Remedial Investigations and Feasibility Studies (RI/FSs) be conducted on these Sites. The North Branch Site includes the Willow Street/Hawthorne Avenue Station Operable Unit (OU), the North Station OU and the Division Street Station OU. Each of the three OUs includes the portion of the North Branch of the Chicago River (the River) that is adjacent to the respective upland portion of the OU.

This Site-Specific FSP addresses the Willow Street/Hawthorne Avenue Station OU of the North Branch Site.

Integrys Business Support, LLC (IBS) is managing the work in the AOC/SOW on behalf of Peoples Gas. Unless specifically noted, the relevant sections of the Multi-Site FSP Rev 4, dated September 8, 2008 will be used while implementing the Site-Specific Work Plan (SSWP) at the Willow Street/Hawthorne Avenue Station OU. This Site-Specific FSP only includes portions of the Multi-Site FSP Rev 4 that require updating for site-specific work at Willow Street/Hawthorne Avenue Station OU.

1.2 Sampling Objectives

See Multi-Site FSP, Rev 4, September 8, 2008.

1.3 Site-Specific Work Plans

1.3.1 Technical Approach

The approach to determine sample locations, types, frequencies, collection methods and field analysis is discussed in Sections 4 and 6 and presented in Tables 1, 2 and 3 of the SSWP. Section 6 and of the SSWP and Tables 1, 2 and 3 also detail the decision process and site knowledge that will be utilized on a real-time basis to determine sample type, location, frequency, and constituents.

1.3.1.1 Soil Sampling

In the case of soil, borings will be continuously sampled and a sample will be selected for chemical analyses based on the presence of impacts identified by PID readings, odors or visual observation. If no impacts are encountered and recovery is sufficient, a sample will be selected for analyses based on a random sample scheme, splitting up the sample depth into 1 foot increments.

Borings will generally be advanced a minimum of 15 feet below ground surface (bgs). Borings that are at least 15 feet deep and are advanced a minimum of 4 feet into native silty clay or clay can be terminated, unless additional advancement is necessary for delineation purposes. For example, if impacts were encountered inward at a depth of 30 feet bgs and a step out boring is advanced to confirm lateral extent, the step out boring must be advanced at least 30 feet bgs as well.

Optional borings will be advanced when initial borings do not fully characterize the extent of impacts.

1.3.1.2 Soil Gas Sampling

The depth of soil gas probes will be to near the surface of the water table. Depending on the depth to the water table, two probes and two soil samples will be collected; one near the water table and another half way up to grade. If probes are installed in buildings, a sub slab sample will also be collected.

Interior soil gas probes may be advanced with hand augers if access to the building basement or slab limits the use of larger equipment (e.g. geoprobe).

1.3.1.3 Groundwater

Groundwater monitoring wells are proposed to be installed in various locations. If groundwater is not encountered during soil boring advancement in a specific location, an off set will be attempted. If no water is present, some well locations may be cancelled.

Contingent well locations will be installed either to replace poor yield locations or to further define impacts. Perched water may be encountered and insufficient water may be present in this area of Chicago.

1.3.1.4 Surface Water

Surface water sampling will be conducted in accordance with the SSWP.

1.3.1.5 Sediment

Sediment sampling and the dynamic process are described the SSWP.

1.3.2 Project Personnel

Figure 1 of this Site-Specific FSP presents technical team strategy and the key project staff responsible for project planning, data and decision quality and final work products, consistent with the Multi-Site Quality Assurance Project Plan (QAPP), Rev 2, dated September 4, 2007 (IBS 2007) and as modified in the Site-Specific QAPP. The Site-Specific QAPP is contained in an appendix to the SSWP.

1.3.3 Subcontractors

A list of subcontracted services will be provided to USEPA for review prior to initiating field work, in accordance with the AOC/SOW.

1.3.4 Communication Strategy

The SSWP provides the site-specific communication strategy, and identifies project communication flow, frequency and documentation requirements between potentially responsible parties/responsible parties, regulators, project managers, field personnel, contractors and others.

1.3.5 Decision-Making Processes

The decision-making process for field activities is provided in Section 6 and Tables 2 and 3 of the SSWP, in Section 1.3.1 of this Site-Specific FSP.

1.3.6 Data Exchange

Section 6 and Tables 2 and 3 of the SSWP describe the data required to make field decisions. Analytical data reports will be provided to USEPA in an electronic format in accordance with the Multi-Site QAPP (IBS 2007c). Data will be provided in the form of a monthly progress report submitted on the 15th day of each month, provided it has been validated. Data may also be provided in figures and tables for submittal with the progress report. The usability of previously collected data will be evaluated according to criteria specified in the Site-Specific QAPP. The Site-Specific Conceptual Site Model (CSM) will be refined as investigation data is generated and used to facilitate the RI. The RI Report will be submitted in accordance with the Project Schedule presented in the SSWP.

1.3.7 Field Sampling Forms

Updated field sampling forms for sediment sample collection, sediment poling and surface water sampling are provided in Attachment 1.

2 SAMPLE LOCATIONS

See Multi-Site FSP, Rev 4, September 8, 2008.

3 FIELD MOBILIZATION AND SITE ACCESS

See Multi-Site FSP, Rev 4, September 8, 2008.

4 DATA COLLECTION PROCEDURES

4.1 Field Standard Operating Procedures

See Multi-Site FSP, Rev 4, September 8, 2008.

4.2 Soil Sampling

See Multi-Site FSP, Rev 4, September 8, 2008.

4.2.1 Data Uses

Soil data may be collected from various depth intervals. Results from samples collected from the ground surface to 10 feet below ground surface (bgs) may be used to support the human health dermal and inhalation exposure routes, depending on the location of sampling. Deeper subsurface soil samples may be collected to evaluate the vertical extent of MGP residuals, to support a random sampling scheme if no impacts are observed, or to evaluate remedial alternatives, if required.

4.2.2 Surface Soil Samples

See Multi-Site FSP, Rev 4, September 8, 2008 and the SSWP for proposed locations of surface soil samples.

4.2.3 Subsurface Soil Samples

Subsurface soil is defined as soil at depths greater than 2 feet bgs. Samples will be collected as described in Sections 4 and 6 and Table 2 and 3 of the SSWP. A guidance document for describing coal tar contamination in soil is included in Appendix D of the SSWP.

4.2.4 Test Pits

No test pits are planned as part of the SSWP.

4.2.5 Soil Borings

See Multi-Site FSP, Rev 4, September 8, 2008..

4.2.6 Subsurface Probes

No subsurface probes are planned as part of the SSWP.

4.2.7 Borehole Abandonment

Boreholes will be abandoned in accordance with 77 Illinois Administrative Code (IAC) Part 920.120.

4.3 Geophysical Methods

4.3.1 Overview

Geophysical data will be collected as part of the SSWP for sediment samples.

4.3.2 Upland Applications

No Upland geophysical data will be collected as part of the SSWP.

4.3.3 Sediment Applications

See Multi-Site FSP, Rev 4, September 8, 2008.

4.3.4 Base Mapping and Survey Control

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4 Groundwater Sampling

4.4.1 Overview

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4.2 Data Uses

Groundwater data will be collected to support the evaluation of human health dermal and ingestion exposure routes. Groundwater data will also be collected to evaluate groundwater quality at the surface water interface and to evaluate related vapor intrusion potential, if impacts are present.

4.4.3 Water Level Elevation Readings

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4.4 Groundwater Grab Samples

No groundwater grab samples are planned as part of the SSWP.

4.4.5 Monitoring Wells

4.4.5.1 Well Placement

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4.5.2 Well Screen Placement

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4.5.3 Temporary Monitoring Wells

No temporary monitoring wells are planned as part of the SSWP.

4.4.5.4 Small-Diameter Prepacked Monitoring Wells

No prepacked monitoring wells are planned as part of the SSWP.

4.4.5.5 Large-Diameter Monitoring Wells

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4.6 Monitoring Well Development

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4.7 Monitoring Well Groundwater Sampling

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4.7.1 Purging

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4.7.2 Sample Collection

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4.7.2.1 Bailer Sampling

Bailer sampling is not planned as part of the SSWP. If bailer sampling is opted for due to the presence of low-producing wells, see the Multi-Site FSP, Rev 4, September 8, 2008.

4.4.7.2.2 Low-Flow Sampling

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4.7.2.3 Diffusion Sampling

Diffusion sampling is not planned as part of the SSWP.

4.4.8 Potable Wells

No potable well samples are planned as part of the SSWP.

4.4.9 Aquifer Characterization

See Multi-Site FSP, Rev 4, September 8, 2008.

4.4.10 Monitoring Well Abandonment

See Multi-Site FSP, Rev 4, September 8, 2008.

4.5 Groundwater / Surface Water Dynamic Evaluation

No groundwater/surface water (gw/sw) dynamic evaluations are planned as part of the SSWP.

4.5.1 Direct Pore Water Sampling

No groundwater/surface water dynamic evaluations are planned as part of the SSWP.

4.5.2 Indirect Pore Water Samplers

No groundwater/surface water dynamic evaluations are planned as part of the SSWP.

4.5.3 Pore Water Sampling Summary

No groundwater/surface water dynamic evaluations are planned as part of the SSWP.

4.6 Surface Water Monitoring

See Multi-Site FSP, Rev 4, September 8, 2008.

4.7 Sediment Sampling

See Multi-Site FSP, Rev 4, September 8, 2008.

4.8 Soil Vapor Assessment

See Multi-Site FSP, Rev 4, September 8, 2008.

4.9 Field Documentation

See Multi-Site FSP, Rev 4, September 8, 2008.

5 SAMPLE HANDLING

See Multi-Site FSP, Rev 4, September 8, 2008.

5.1 Sample Identification

Soil samples will be identified as follows:

WHS-SB117-001
WHS – Peoples Willow/Hawthorne
SB117 – Soil boring 117
001 – Primary soil sample from this soil boring

Groundwater samples will be identified as follows:

WHS-MW101-001
WHS – Peoples Willow/Hawthorne
MW101 – Monitoring well 101
001 – Primary groundwater sample from this monitoring well

Soil gas samples will be identified as follows:

WHS-SG001-4'-001
WHS – Peoples Willow/Hawthorne
SG001 – Soil gas location 001
4' – depth of gas vapor probe at 4'
001 – Primary groundwater sample from this monitoring well

Waste characterization samples will be identified as follows:

WHS-SWC01
WHS – Peoples Willow/Hawthorne
SWC01 – Soil waste characterization; first sample

Duplicate samples will be identified as follows:

Example: WHS-SB117-101
101 – Duplicate sample
WHS-RB01

WHS – Peoples Willow/Hawthorne
RB01 – Rinsate blank; first sample

Trip blank samples will be identified as follows:

WHS-TB01
WHS – Peoples Willow/Hawthorne
TB01 – Trip blank; first sample

For additional information see the Multi-Site FSP, Rev 4, September 8, 2008.

5.2 Sample Container, Volume, Preservation and Holding Times

See Multi-Site FSP, Rev 4, September 8, 2008.

5.3 Field Sampling Quality Control

See Multi-Site FSP, Rev 4, September 8, 2008.

5.4 Sample Custody

See Multi-Site FSP, Rev 4, September 8, 2008.

5.5 Sample Shipping

See Multi-Site FSP, Rev 4, September 8, 2008.

6 SAMPLE ANALYSIS

See Multi-Site FSP, Rev 4, September 8, 2008.

7 FIELD SURVEYING

See Multi-Site FSP, Rev 4, September 8, 2008.

8 DECONTAMINATION

See Multi-Site FSP, Rev 4, September 8, 2008.

9 MANAGEMENT OF INVESTIGATION DERIVED WASTES

See Multi-Site FSP, Rev 4, September 8, 2008.

10 REFERENCES

ASTM International. 2006a. D2488-06 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). ASTM Book of Standards Volume 4.08.

ASTM International. 2006b. D4700-91(2006) Standard Guide for Soil Sampling from the Vadose Zone. ASTM Book of Standards Volume 4.08.

Crumbing, D., J. Hayworth, B. Call, W. Davis, R. Howe, D. Miller and R Johnson, 2004, The Maturing Triad approach: Avoiding Misconceptions; Remediation, Autumn 2004, pp. 81-96.

GeoInsight®, 2006, GeoInsight Web Pages, http://www.geoinsightonline.com/.

Geoprobe®, 2006, Geoprobe Web Pages, http://www.geoprobe.com/index.htm.

ITRC, 2004. Sampling for Contaminants in Sediments and Sediment Pore Water. http://clu-in.org/programs/21m2/sediment/.

ITRC. 2007a. Vapor Intrusion Pathway: A Practical Guideline (VI-1). ITRC, Washington DC, January 2007.

ITRC. 2007b. Vapor Intrusion Pathway: Investigative Approaches for Typical Scenarios, A Supplement to *Vapor Intrusion Pathway: A Practical Guideline* (VI-1A). ITRC, Washington DC, January 2007.

ITRC, 2007c, Integrated Pore-Water and Geophysical Investigations Streamline Characterization of Ground-Water Discharges to Surface Water, http://cluin.org/products/newsltrs/tnandt/view.cfm?issue=0307.cfm#4

Integrys Business Support, 2007a, Multi-Site Conceptual Site Model, Former Manufactured Gas Plant Sites, Rev 0, August 2007.

Integrys Business Support, 2007b, Multi-Site Risk Assessment Framework, Former Manufactured Gas Plant Sites, Rev 0, September 2007.

Integrys Business Support, 2007c, Multi-Site Health and Safety Plan, Former Manufactured Gas Plant Sites, Rev 0, August 2007.

Integrys Business Support, 2007d, Multi-Site Quality Assurance Project Plan, Former Manufactured Gas Plant Sites, Rev 2, September 2007.

Integrys Business Support, 2008, Multi-Site Field Sampling Plan, Former Manufactured Gas Plant Sites, Rev 4, September 2008.

MacDonald, D.D., C.G., Ingersoll, and T.A. Berger, 2000, Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems, Archives of Environmental Contamination and Toxicology 39: 20-31.

MHE Products, 2001, PushPoint Sampler Operators Manual and Applications Guide, Ver. 2.00 (Models: PP27, PP14, PPX36, PPX72).

Stach, E. 1982. Stach's Textbook of Coal Petrology, third revised and enlarged edition. Gebr Borntraeger Verlagsbuchhandlung, Science Publishers.

USDOE, 2002, *Adaptive Sampling and Analysis Program (ASAP)*, Environmental Assessment Division (EAD), http://www.ead.anl.gov/project/dsp_topicdetail.cfm?topicid=23.

USEPA, 1987, A Compendium of Superfund Field Operation Methods, Office of Emergency and Remedial Response, EPA/540/P-87/001, December 1987.

USEPA, 1988, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Office of Solid Waste and Emergency Response, EPA/540/G-89/004, October 1988.

USEPA, 1992, Guide to Management of Investigative- Derived Waste (IDW). Office of Solid Waste and Emergency Response. Publication 9345.3-03FS, January 1992.

USEPA. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Method 8270C - Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS). USEPA SW-846. December 1996.

USEPA, 1997a, Ecological Risk Assessment Guidance for Superfund (ERAGS): Process for Designing and Conducting Ecological Risk Assessments, Interim Final, EPA/540/R 97/006, Environmental Response Team, Edison, NJ, 1997.

USEPA, 1997b, Field Analytical and Site Characterization Technologies Summary of Applications, EPA-542-R-97-011, Office of Solid Waste and Emergency Response, Washington, DC, November 1997.

USEPA, 1998, Guidelines for Ecological Risk Assessment, EPA/630/R-95/002F, Risk Assessment Forum, Washington, D.C., 1998.

USEPA, 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002.

USEPA. 2000a. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, 2nd edition. EPA 600/R-99-0\4, March 2000. http://www.ehso.com/ehso3.php?URL=http%3A%2F%2Fwww.epa.gov/ost/cs/freshfact.html.

USEPA, 2000b Innovations In Site Characterization Case Study: Site Cleanup Of The Wenatchee Tree Fruit Test Plot Site Using A Dynamic Work Plan, EPA 542-R-00-009, Washington, DC, August 2000.

USEPA, 2001, Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, USEPA Region IV, November 2001.

USEPA, 2002a, Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), OSWER, EPA 530-D-02-004.

USEPA, 2002b, On-line field analytical technologies encyclopedia (FATE), http://fate.clu-in.org/.

USEPA, 2002c, Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers, OSWER, EPA 542-S-02-001.

USEPA, 2003a, Improving Decision Quality: Making the Case for Adopting Next-Generation Site Characterization Practices, Wiley Periodicals, Inc.

USEPA, 2003b, Procedure for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures, EPA-600-R-02-013, Office of Research and Development, Washington, D.C., 2003.

USEPA, 2003c, Using Dynamic Field Activities for On-Site Decision Making: A Guide for Project Managers, EPA/540/R-03/002, OSWER No. 9200.1-40, -600-R-02-013, Office of Solid Waste and Emergency Response, Washington, D.C., May 2003.

USEPA, 2004a, *A Site Characterization Technologies frofor DNAPL Investigations*, USEPA 542-R-04-017.

USEPA, 2004b, Improving Sampling, Analysis, and Data Management for Site Investigation and Cleanup, Office of Solid Waste, EPA-542-F-04-001a, www.epa.gov/tio, www.cluin.org, April 2004,

USEPA, 2004c, Site Characterization Technologies for DNAPL Investigations, Office of Solid Waste, EPA 542-R-04-017 Emergency Response (5102G), http://www.epa.gov/tio, September 2004.

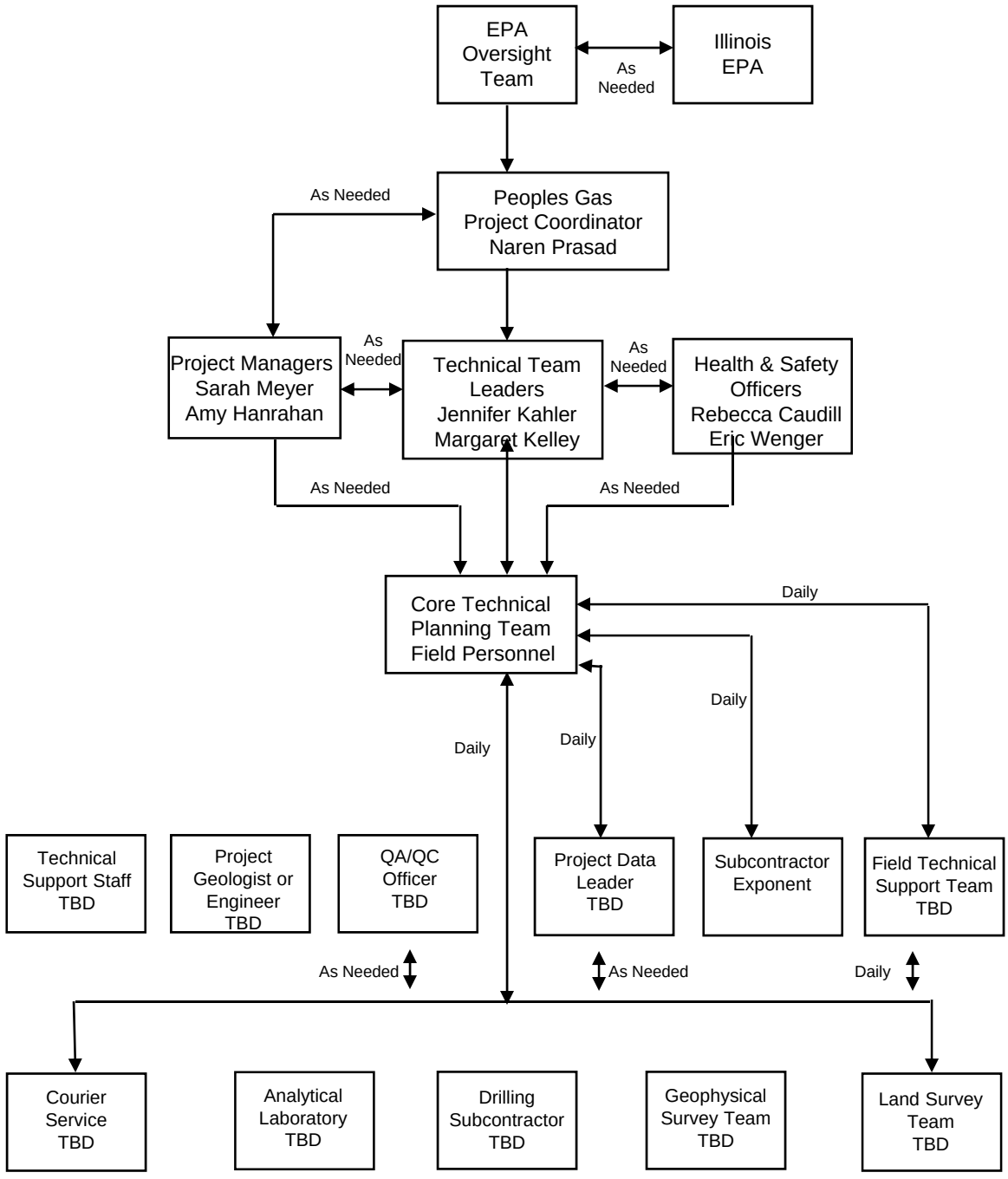
USEPA, 2005. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: Metal Mixtures (Cadmium, Copper, Lead, Nickel, Silver, and Zinc), EPA/600/R-02/011, Office of Research and Development, Washington, D.C., January 2005.

USEPA, 2007, *Settlement Agreement and Administrative Order on Consent for the conduct of Engineering Evaluations and Cost Analysis*. , The Peoples Gas Light and Coke Company and U.S. EPA Region 5, CERCLA Docket No.V-W-07-C-869, dated June 5, 2007.

USGS, 2002, Guidance on the Use of Passive-Vapor-Diffusion Samplers to Detect Volatile Organic Compounds in Ground-Water-Discharge Areas, and Example Applications in New England: U.S. Geological Survey Water-Resources Investigations Report 02-4186, 79 p. Church, P.E., Vroblesky, D.A., Lyford, F.P., and Willey, R.E.,

Water-Resources Investigations Report 02-4186. Peter E. Church, Don A. Vroblesky, Forest P. Lyford, and Richard E. Willey.

Appendix C-3
Figure 1
Technical Team Strategy



TBD – To Be Determined

Attachment 1: Field Sampling Forms

SURFACE WATER SAMPLING FIELD FORM

Staff Gauge Reading
Time _____ Reading _____ ft

General Information

Site : _____
Project # : _____
Task # : _____
Date : _____
Samplers : _____

Sampling Equipment: _____
Coordinate System: _____
Datum: _____
Weather: _____
River Section/DMU: _____

						Multi Sensor					Turbidity Sensor							
Sample/Location ID	**Time (military)**	**Depth to Sediment**	**Depth to Refusal**	**Penetration Thickness**	**Water Sample Depth**	**Temp (°C)**	**Conductivity (SpC)**	**DO (mg/L)**	**pH**	**ORP**	**Turbidity (NTU)**	**Temp (°C)**	**Depth (ft), x0.2ft, x0.8ft**	**Average Velocity (FPS)**	**Max Velocity (FPS)**	**Sample Location X**	**Sample Location Y**	**Sample Notes**

Notes: (1) Water Elevation = Staff Gauge Elevation - Staff Gauge Reading, Calculated at end of day, based on a minimum of 2 staff gauge readings.

(2) Sample coordinates will be recorded after being post processed, when applicable.

n/a : **Not Applicable**

Additional Comments: _____

POLING FIELD FORM

Staff Gauge Reading
Time _____ Reading _____ ft

General Information

Site : _____
Project # : _____
Task # : _____
Date : _____
Samplers : _____

Sampling Equipment: _____
Coordinate System: _____
Datum: _____
Weather: _____
River Section/DMU: _____

Sample ID	Time (military)	Water Elevation	Depth to Sediment	Depth to Hard Bottom/ Refusal	Poling Thickness / Sample Interval	Sample Location X	Sample Location Y	Sample Description (Color, Texture, Odor)	Sample Notes

Notes: (1) Water Elevation = Staff Gauge Elevation - Staff Gauge Reading, Calculated at end of day, based on a minimum of 2 staff gauge readings

(2) Sample coordinates will be recorded after being post processed, when applicable.

n/a : **Not Applicable**

Sample Collection and Processing Log

Staff Gauge Reading
Time _____ Reading _____ ft

General Information

Project Name/Site : _____ **Sampling Equipment:** _____
Project # : _____ **Coordinate System:** _____
Task # : _____ **Datum:** _____
Date : _____ **Weather:** _____
Samplers : _____ **River Section/DMU:** _____

Sample Location	Time (military)	Water Elevation[1]	Water Depth (ft)	Penetration (ft)	Sediment Recovered (ft)	% Recovery	Sample Location (Northing)[2]	Sample Location (Easting)[2]	Sample Notes

Sample Intervals (in)	Sample Description	Date Processed	Sample Intervals (in) TOP	Sample Intervals (in) BOTTOM	COC Sample ID Number

Additional Comments: _____

Notes: (1) Water Elevation = Staff Gauge Elevation - Staff Gauge Reading, Calculated at end of day, based on a minimum of 2 staff gauge readings.
(2) Sample coordinates will be recorded after being post processed, when applicable.

n/a : **Not Applicable**
COC: Chain of Custody

Sampling/Processing Personnel Signature: _____